

CLAIMS

1. A cell that expresses a gene encoding a ligand responsive transcriptional regulatory factor and that comprises the following genes (a) and (b) introduced to the chromosomes thereof:
 - (a) a reporter gene ligated downstream of a recognition sequence for the ligand responsive transcriptional regulatory factor and a nucleotide sequence necessary for the initiation of transcription; and
 - (b) a reporter gene that encodes a protein distinguishable from a protein encoded by the above reporter gene and that is ligated downstream of a promoter making no change of transcriptional activity from a ligand contact with the ligand responsive transcriptional regulatory factor.
2. A cell that expresses an aryl hydrocarbon receptor gene and that comprises the following genes (a) and (b) introduced to the chromosomes thereof:
 - (a) a reporter gene ligated downstream of a recognition sequence for the aryl hydrocarbon receptor and a nucleotide sequence necessary for the initiation of transcription; and
 - (b) a reporter gene that encodes a protein distinguishable from a protein encoded by the above reporter gene and that is ligated downstream of a promoter making no change of transcriptional activity from a ligand contact with the ligand responsive transcriptional regulatory factor.
3. A cell that expresses an aryl hydrocarbon receptor gene and that comprises the following genes (a) and (b) introduced to the chromosomes thereof:
 - (a) a reporter gene ligated downstream of a recognition sequence for the aryl hydrocarbon receptor and a nucleotide sequence necessary for the initiation of transcription; and

(b) a reporter gene that encodes a protein distinguishable from a protein encoded by the above reporter gene and that is ligated downstream of a promoter making no change of transcriptional activity from a dioxin contact.

5 4. A cell that expresses an aryl hydrocarbon receptor gene and an Arnt gene and that comprises the following genes (a) and (b) introduced to the chromosomes thereof:

(a) a reporter gene ligated downstream of a recognition sequence for the aryl hydrocarbon receptor and a nucleotide sequence necessary for
10 the initiation of transcription; and

(b) a reporter gene that encodes a protein distinguishable from a protein encoded by the above reporter gene and that is ligated downstream of a promoter making no change of transcriptional activity from a ligand contact with the ligand responsive transcriptional regulatory factor.

15 5. Use of a cell according to any one of claim 1, 2, 3, or 4 for evaluating the agonist or antagonist activity of a test substance against the ability of a ligand responsive transcriptional regulatory factor to promote transcription in a reporter assay measuring the amount of expression of a reporter gene that undergoes transcriptional regulation by the ligand
20 responsive transcriptional regulatory factor.

6. A method for evaluating the agonist activity of a test substance against the ability of a ligand responsive transcriptional regulatory factor to promote transcription, which comprises the steps of:

(1) culturing a cell according to any one of claim 1, 2, 3, or 4 in
25 the presence of a test substance, and then measuring the amounts of expression of the reporter genes in this cell;

(2) selecting a measured value of the amount of expression of the reporter gene ligated downstream of a recognition sequence for the ligand

responsive transcriptional regulatory factor and a nucleotide sequence necessary for the initiation of transcription, based on a measured value of the amount of expression of the reporter gene ligated downstream of a promoter making no change of transcriptional activity from a ligand contact; and

- 5 (3) evaluating that the test substance has agonist activity against the ability of the ligand responsive transcriptional regulatory factor to promote transcription, when the measured value of the amount of expression of the reporter gene selected in step (2) is greater than the measured value of the amount of expression of this reporter gene in the absence of the
10 test substance.

7. A method for evaluating the antagonist activity of a test substance against the ability of a ligand responsive transcriptional regulatory factor to promote transcription, which comprises the steps of:

- (1) culturing a cell according to any one of claim 1, 2, 3, or 4 in
15 the presence of a ligand for the ligand responsive transcriptional regulatory factor and a test substance, and then measuring the amounts of expression of the reporter genes in this cell;

- (2) selecting a measured value of the amount of expression of the reporter gene ligated downstream of a recognition sequence for the ligand
20 responsive transcriptional regulatory factor and a nucleotide sequence necessary for the initiation of transcription, based on a measured value of the amount of expression of the reporter gene ligated downstream of a promoter making no change of transcriptional activity from a ligand contact; and

- (3) evaluating that the test substance has antagonist activity
25 against the ability of the ligand responsive transcriptional regulatory factor to promote transcription, when the measured value of the amount of expression of the reporter gene selected in step (2) is smaller than the measured value of the amount of expression of this reporter gene under the conditions

that the ligand is present but the test substance is absent.

8. A kit for measurement comprising a cell according to any one of claim 1, 2, 3, or 4.